GRT AVIONICS

Dual Electronics XGPS170 ADS-B Receiver

Equipment Supplement

Revision A3

9-Jul-2014

Revision Notes

Revision	Date	Change Description
A	17-Jun-2013	Initial Release
A1	19-Jun-2013	Corrected error in Section 4 regarding ADS-B Traffic annunciation on EFIS screen
A2	8-Jul-2013	Added note about Trig ADS-B Out settings (Section 3.1) Added a third powered USB hub option (Section 1.2)
A3	9-Jul-2014	Corrected list of apps (Section 2.1) Updated EFIS screen ADS-B indications to be consistent with the latest EFIS software- HXr v. 2b, HX v. 6a, SX v. 10 (Sections 3 and 4)

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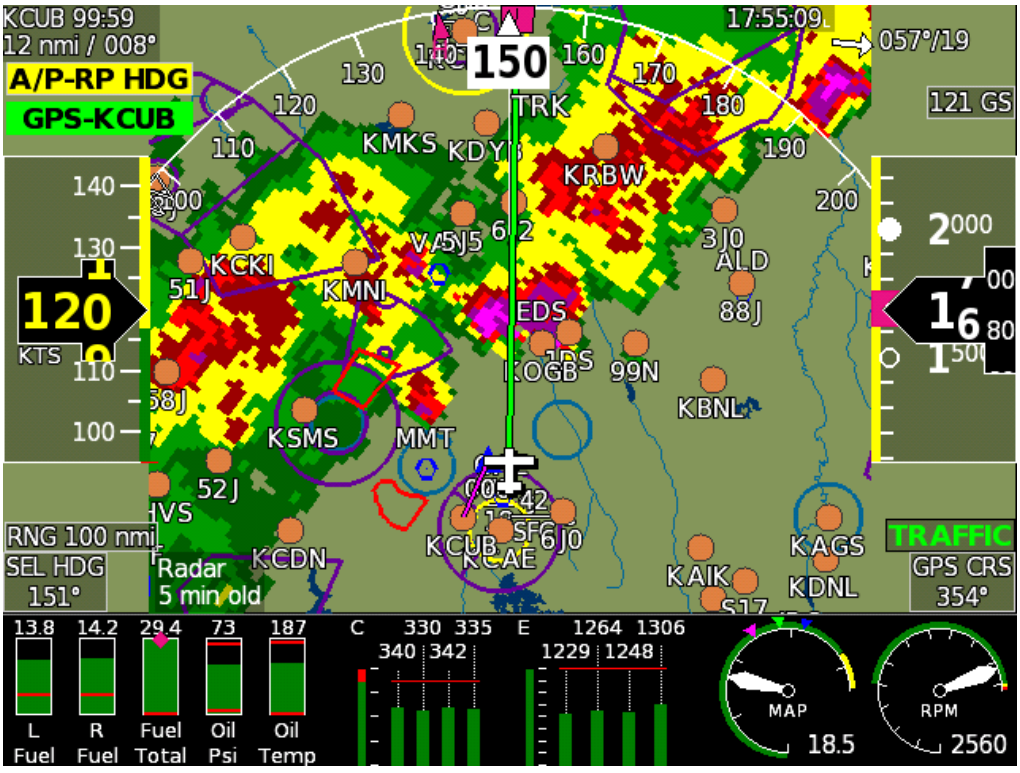


Radar imagery on the Sport SX (courtesy of James Clark)

Section 1: Introduction

1.1 About the Dual XGPS170

The Dual XGPS170 is a 978 MHz ADS-B receiver that receives FIS-B weather and TIS-B traffic data and displays it via USB on GRT Horizon HX, HXr and Sport SX EFIS screens. It also transmits data through Bluetooth to Android and Apple tablets and phones that can display ADS-B information.

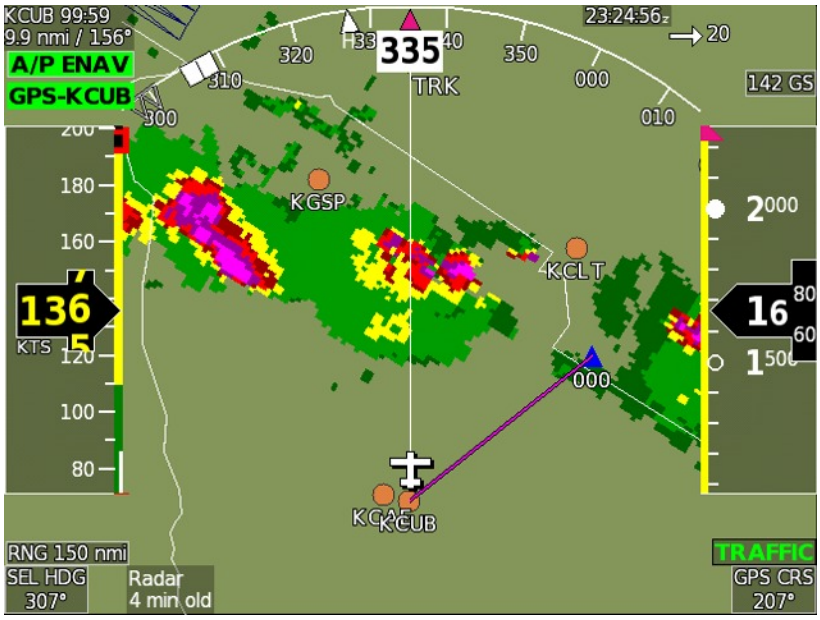
NOTE: GRT Horizon/Sport HS and WS units do not support USB receivers, including Dual XGPS170. These systems require a receiver with RS-232 serial output.

WARNING: The Dual XGPS170 is a receiver ONLY. Do not expect or rely on any traffic information unless your aircraft is also participating in ADS-B OUT. GRT recommends the use of an ADS-B compliant Mode S extended-squitter transponder, such as the Trig TT22, coupled with WAAS GPS for full ADS-B participation. Please read the ADS-B page on the GRT website for more information on current ADS-B options and how the system works.

Follow all instructions in the Dual XGPS170 owner's manual thoroughly. This supplement is intended to support GRT users with information about connection and use with GRT EFIS systems, and may not be totally up-to-date with all Dual specifications.

The interface between this receiver and GRT display units allows for:

- FIS-B subscription-free weather information displayed on a GRT display unit while within ADS-B ground coverage;
- TIS-B traffic information displayed on a GRT display unit while within ADS-B ground coverage;
- Direct airplane- to-airplane traffic information displayed on a GRT display unit from nearby aircraft participating in ADS-B OUT on 978 MHz UAT frequencies.



Radar image from Dual XGPS170 on a Sport SX

(Image courtesy of James Clark)

1.2 Data Port and Hardware Requirements

Display Unit Data Port	USB port
Power Connections	Internal rechargeable battery lasts up to 5 hours. Charges through USB port. See USB Hub section below for wiring guidelines.
Antennas	Short antenna included. Extensions or external antennas optional.

USB HUB: The Dual XGPS170 charges its internal battery through the USB connection. The USB port in the GRT display unit was not designed to handle the power requirements of charging or running electronic devices. Therefore, GRT strongly recommends use of a powered USB hub instead of connecting the ADS-B receiver directly to the display unit. The hub will add functional USB ports to the display unit and will avoid overload of its internal power supply circuitry.

These USB hubs have been tested by GRT beta testers and customers:

- StarTech 4-port USB Hub, p/n ST4200USBM, available from Amazon.com. 7-24V DC
- Netix P5USB, p/n CNX-P5USB, 7-32V DC
- USBGear 4-port 3.0 USB Hub, p/n USBG-4U3ML, available from Amazon.com. 7-24V DC. Capable of charging iPads.

All of the recommended hubs have connections for external power. They should be wired to the avionics bus, as the power coming out of the USB hub in the display unit is not adequate for powering the hub.

CAUTION: Charging or powering any USB electronic devices other than USB thumb drives or Bluetooth adapters using the EFIS USB port may overload the internal electrical components of the display unit, causing premature failure. This type of failure is not covered under warranty.

Antennas: The use of an externally-mounted antenna is optional. GRT beta testers in Van's RV aircraft have reported good signal with the included antenna when the unit is within view of the sky (typically on the instrument panel glare shield). Signal reception may be improved by mounting an antenna on the belly of the aircraft. The included antenna may be removed and a dedicated passive transponder or DME antenna may be connected in its place.

StarTech 4-port USB hub

Section 2: Installation & Wiring

2.1 Suggested Connections

USB only. Serial is not supported by Dual XGPS170. See Section 1 of this manual, Data Port and Hardware Requirements, for more information.

NOTE: Even though the Dual XGPS170 can communicate via Bluetooth, the EFIS can only communicate with it through USB. The EFIS Bluetooth currently only uses the GRT REMOTE app for Android.

Using Android & Apple Tablets

The Dual XGPS170 can communicate via Bluetooth to two tablets of **either** the Apple or Android operating system. It has a switch that allows transmission of either Apple or Android Bluetooth protocol. **NOTE:** Most Android tablets can only be paired to one Bluetooth device at a time; therefore, if the Android tablet is used for the GRT REMOTE app, it will **not** be able to simultaneously communicate with the XGPS170.

The XGPS170 displays ADS-B information on tablets running Electronic Flight Bag (EFB) apps such as WingX Pro7, Avare, Naviator, FlightPro, and AOPA FlyQ. See www.gps.dualav.com or the XGPS170 user manual for more information.

2.2 Mechanical Installation

Placement of the Receiver

The receiver should be installed within view of the sky. It is designed to be placed on top of the instrument panel, but it can be mounted to a bracket in the baggage compartment or other area behind the firewall that is not covered by metal.

Receiver GPS Antenna

The XGPS170 has an internal WAAS GPS receiver for locating its own position. Place the unit in a location that has a clear view of the sky at all times.

Placement of the USB Hub

The USB hub is usually mounted near the instrument panel and avionics bus for convenient connection to the aircraft's electrical system and GRT display unit. A USB cable is then run from the hub to the Dual unit, which requres a mini-USB connector.

Placement of External Antennas

External transponder-type antenna should ideally be at least 4 feet from the dedicated transponder antenna, but not on multiples of 4 feet (due to wavelength). Place on the bottom of the aircraft for the best angle to receive ADS-B ground signals.

Section 3: Setup & Programming

3.1 Display Unit & Dual XGPS170 Setup

1. After the XGPS170, antenna, and USB hub are installed and wired, use the following procedure to program the display unit to communicate with it.
2. Power up the system. Access the Setup Menu on the display unit that the Dual/USB hub is connected to.
3. Under General Setup, scroll to just below the Serial Port setup options. Highlight **USB ADS-B** option and turn knob to select ON.
4. Stay on General Setup screen. Scroll down to Traffic Altitude Filter. Use this to filter out traffic beyond a certain reported altitude from your position, excluding irrelevant traffic from the map.
5. Press SAVE softkey.
6. If your transponder is being used for ADS-B Out and it has not already been programmed, set it up using the transponder manufacturer's instructions and its GRT supplement if applicable. **Note to Trig Users:** Answer "1090ES Receiver On Board?" with NO.

Setting	**Value**	**Notes**
Flight ID and Address*	–	Press to activate menu
Flight ID*	Enter actual value	Enter aircraft registration/N-number
Mode S Address*	Enter actual value	Mode S code (base 16-Hex). Find by looking up N-number on FAA website. Note: The 6-digit Mode S code is only listed for aircraft with an airworthiness certificate, and not for reserved N-numbers.
USB ADS-B	On	Tells display unit to expect ADS-B data through USB port.
Traffic Altitude Filter	Set to preference	Excludes traffic alerts outside of the selected altitude.
*Set this up to receive traffic data if you are transmitting ADS-B Out using an extended-squitter transponder.		

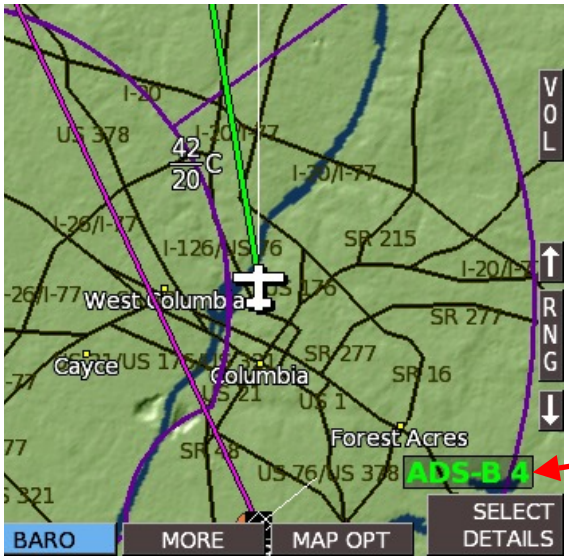
3.2 Post-Installation Checkout

1. Pull the aircraft outside and power up the EFIS system and ADS-B receiver.

2. Check the LED status lights on the ADS-B receiver for power and signal. Note that ADS-B often cannot be received on the ground unless a ground station is nearby.

3. Go to Set Menu > Display Unit Maintenance. Scroll to ADS-B Status. If the Valid Frames counter is counting, data packets are being received.

4. When the receiver is within range of one or more ADS-B ground towers, a green **ADS-B x** icon will appear on the side of the moving map, with the "x" representing the number of towers received. See image below.



The receiver is communicating with 4 ADS-B ground towers.

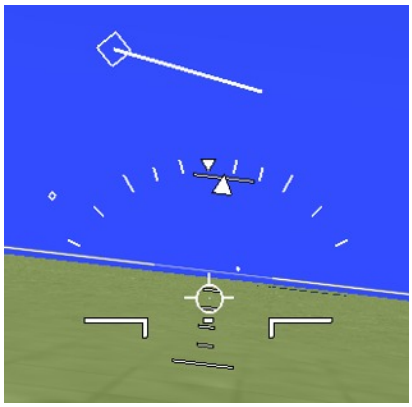
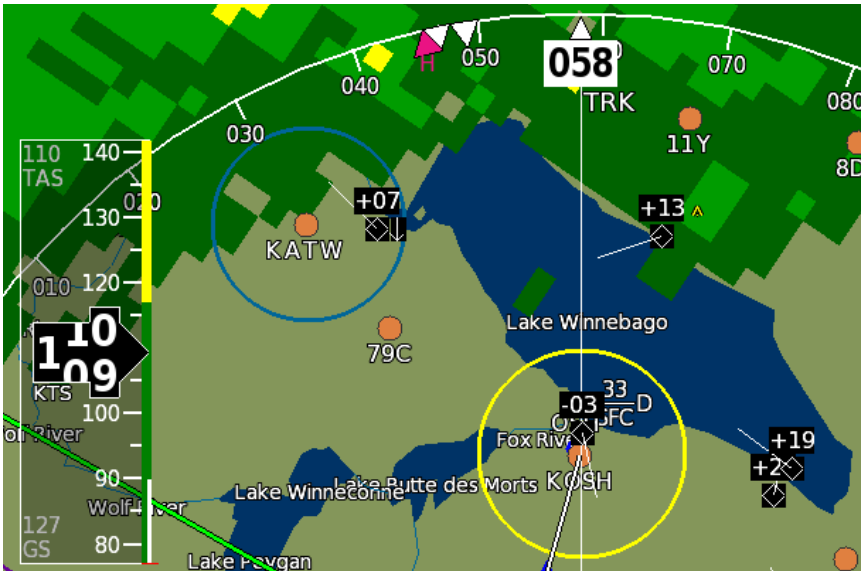
Section 4: Using the Dual XGPS170 ADS-B Receiver

1. **WEATHER:** Bring up the MAP screen. Under the SHOW softkey, there is a list of items to choose from. (RADAR, SHADE, TERRAIN, WIND, METARS, etc.) Note that only one of the map features can be selected; Radar information will replace Terrain because the color shading of both features together is confusing. (On HXr, access SHOW softkey by pressing SCREEN, then MAP OPTIONS softkeys.) When selected on the MAP screen, radar will also be displayed in the HXr map inset.

2. **METARS and TAFS**, if available, are shown on the WPT DETAILS page of the airport. Select METARS on the moving map SHOW menu to display color-coded METAR symbols.

3. Go to the Moving Map Setup Menu for traffic alert and AIRMET, METAR, & TAF viewing options:

Setting	Value	Notes
Traffic Alert Window	On or Off	Traffic inset automatically appears when traffic is a threat.
Show AIRMET	Choose to show on all MAP pages, on North-Up page only, or never.	
Color airports using METARS		
METAR Text	Choose to display weather report text in Raw or Translated (English) form	
TAF Text		

4. **TFRs** are currently not shown, but will be available with a future software update.

5. **Traffic** is shown as a black diamond icon with the altitude above or below you in hundreds of feet, an arrow that shows if it is climbing or descending, and a vector line that shows the approximate direction of flight. In addition to the moving map and geo-referenced charts, traffic icons can also be displayed in 3D on the PFD. To turn PFD traffic on or off, go to Set Menu > Primary Flight Display and scroll to Traffic In View. Select ON or OFF.